



# County of San Diego, Planning & Development Services

## SPAN TABLES

### BUILDING DIVISION

#### ALLOWABLE SPANS FOR JOISTS AND RAFTERS <sup>1, 7</sup>

Lumber Grade		FLOOR JOISTS		CEILING JOISTS <sup>5</sup>		RAFTER-CEILING JOIST COMBINATION		RAFTER-CEILING JOIST COMBINATION		RAFTERS <sup>6</sup>	
DOUGLAS FIR-LARCH NO.2 OR BETTER		Drywall Below <sup>2</sup>	No Finish Below <sup>2</sup>	Plaster Below <sup>2</sup>	Drywall Below <sup>3</sup>	Lightweight Roofing; Plaster Below <sup>2</sup>	Lightweight Roofing; Drywall Below <sup>3</sup>	Tile Roofing; Plaster Below <sup>2</sup>	Tile Roofing; Drywall Below <sup>3</sup>	Lightweight Roofing <sup>4</sup>	Tile Roofing <sup>4</sup>
Nominal Size (inches)	O.C. Spacing (inches)	DL = 15 psf LL = 40 psf	DL = 10 psf LL = 40 psf	DL = 10 psf LL = 10 psf	DL = 5 psf LL = 10 psf	DL = 20 psf LL = 20 psf	DL = 15 psf LL = 20 psf	DL = 30 psf LL = 20 psf	DL = 25 psf LL = 20 psf	DL = 10 psf LL = 20 psf	DL = 20 psf LL = 20 psf
2 x 4	12	6' - 9"	6' - 9"	9' - 9"	12' - 5"	8' - 5"	9' - 6"	7' - 11"	8' - 2"	10' - 10"	9' - 10"
	16	6' - 2"	6' - 2"	8' - 11"	11' - 3"	7' - 7"	8' - 8"	7' - 3"	7' - 5"	9' - 10"	8' - 6"
	24	5' - 3"	5' - 4"	7' - 9"	9' - 10"	6' - 7"	7' - 4"	6' - 1"	6' - 5"	8' - 0"	6' - 11"
2 x 6	12	10' - 8"	10' - 8"	15' - 5"	19' - 6"	13' - 4"	15' - 1"	12' - 7"	12' - 11"	16' - 7"	14' - 4"
	16	9' - 9"	9' - 8"	14' - 0"	17' - 8"	12' - 1"	13' - 3"	11' - 1"	11' - 8"	14' - 4"	12' - 5"
	24	7' - 8"	8' - 1"	12' - 2"	14' - 10"	10' - 1"	10' - 10"	9' - 0"	9' - 6"	11' - 9"	10' - 2"
2 x 8	12	13' - 10"	14' - 1"	20' - 3"	25' - 8"	17' - 7"	19' - 6"	16' - 3"	17' - 2"	21' - 0"	18' - 2"
	16	12' - 0"	12' - 7"	18' - 5"	23' - 0"	15' - 9"	16' - 10"	14' - 1"	14' - 10"	18' - 2"	15' - 9"
	24	9' - 9"	10' - 3"	16' - 1"	18' - 9"	12' - 10"	13' - 9"	11' - 5"	12' - 1"	14' - 10"	12' - 10"
2 x 10	12	16' - 11"	17' - 9"	25' - 11"	*	22' - 4"	23' - 10"	19' - 11"	21' - 0"	25' - 8"	22' - 3"
	16	14' - 9"	15' - 4"	23' - 6"	*	19' - 4"	20' - 8"	17' - 3"	18' - 2"	22' - 3"	19' - 3"
	24	11' - 11"	12' - 6"	19' - 10"	22' - 11"	15' - 9"	16' - 10"	14' - 0"	14' - 10"	18' - 2"	15' - 8"
2 x 12	12	19' - 7"	20' - 7"	*	*	25' - 11"	*	23' - 2"	24' - 5"	*	25' - 9"
	16	17' - 0"	17' - 10"	*	*	22' - 5"	24' - 0"	20' - 0"	21' - 1"	25' - 9"	22' - 4"
	24	13' - 10"	14' - 6"	23' - 0"	*	18' - 3"	19' - 6"	16' - 4"	17' - 2"	21' - 0"	18' - 3"
2 x 14	12	21' - 11"	23' - 0"	*	*	*	*	25' - 11"	*	*	*
	16	19' - 0"	19' - 11"	*	*	25' - 1"	*	22' - 5"	23' - 7"	*	25' - 1"
	24	15' - 6"	16' - 3"	*	*	20' - 5"	21' - 10"	18' - 3"	19' - 3"	23' - 7"	20' - 5"

\*Span exceeds 26 feet in length. Check sources for availability of lumber in lengths greater than 20 feet.

#### ALLOWABLE SPANS FOR OPEN BEAM CEILINGS <sup>1, 2, 7</sup>

Lumber Grade		Lightweight Roofing	Tile Roofing
DOUGLAS FIR-LARCH NO.2 OR BETTER			
Nominal Size (inches)	O.C. Spacing (inches)	DL = 15 psf LL = 20 psf	DL = 25 psf LL = 20 psf
4 x 4	24	10' - 1"	9' - 6"
	32	9' - 1"	8' - 0"
	48	7' - 4"	6' - 6"
4 x 6	24	15' - 11"	14' - 7"
	32	13' - 4"	11' - 9"
	48	10' - 11"	9' - 7"
4 x 8	24	21' - 0"	19' - 4"
	32	17' - 8"	15' - 7"
	48	14' - 5"	12' - 8"
4 x 10	24	*	23' - 9"
	32	21' - 9"	19' - 2"
	48	17' - 8"	15' - 7"

\*Span exceeds 26 feet in length. Check sources for availability of lumber in lengths greater than 20 feet.

#### RAFTER TIE CONNECTIONS

Rafter Slope	Tie Spacing (inches)	Roof Span (feet)			
		12	20	28	36
		Required number of 16d common nails per connection <sup>8, 9</sup>			
3:12	12	4	6	8	10
	16	5	7	10	13
	24	7	11	15	19
	32	10	14	19	25
	48	14	21	29	37
4:12	12	3	4	5	6
	16	3	5	7	8
	24	4	7	10	12
	32	6	9	13	16
	48	8	14	19	24
5:12	12	3	3	4	5
	16	3	4	5	7
	24	4	6	8	10
	32	5	8	10	13
	48	7	11	15	20

#### Notes:

- Used under dry conditions with lumber moisture content less than 16 percent at time of installation.
- Deflection based on L/360 (LL) and L/240 (LL + DL).
- Deflection based on L/240 (LL) and L/180 (LL + DL).
- Deflection based on L/180 (LL) and L/120 (LL + DL).
- Unfinished attic above with no storage.

- Unfinished attic below.
- See DPLU #081 for fastening schedule.
- Equivalent nailing required for ceiling joist to ceiling joist lap splices.
- Connected members shall be of sufficient size to prevent splitting due to nailing.

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## ALLOWABLE PLYWOOD SPANS <sup>1</sup>

Panel Identification Index <sup>6</sup>	Plywood Thickness (inches)	Edges	Maximum Spans (inches)	
			Roof	Floor
12/0	5/16	Blocked	12	0
		Unblocked	12	0
16/0	5/16, 3/8	Blocked	16	0
		Unblocked	16	0
20/0	5/16, 3/8	Blocked	20	0
		Unblocked	20	0
24/0	3/8, 7/16, 1/2	Blocked	24	0
		Unblocked	20 <sup>4</sup>	0
24/16	7/16, 1/2	Blocked	24	16 <sup>2</sup>
		Unblocked	24	0
32/16	15/32, 1/2, 5/8	Blocked	32	16 <sup>2,3</sup>
		Unblocked	28	0
40/20	19/32, 5/8, 3/4, 7/8	Blocked	40	20 <sup>2,3,5</sup>
		Unblocked	32	0
48/24	23/32, 3/4, 7/8	Blocked	48	24 <sup>2</sup>
		Unblocked	36	0

**Notes:**

- 1 Plywood shall be Structural I, Structural II, Standard Sheathing, or CC Exterior grades only. Plywood shall be continuous over two or more spans with face grain perpendicular to supports.
- 2 Blocking may be omitted if plywood edges have approved tongue and groove joints, if 1/4" minimum thickness plywood underlayment is installed, or if finish floor is 3/4" wood strip, or 1 1/2" of approved cellular or lightweight concrete is placed over subfloor.
- 3 May be 24" if 3/4" wood strip flooring is installed at rights angles to joists.
- 4 For 1/2" panel, maximum span shall be 24".
- 5 May be 24" o.c. for floors where 1 1/2" of cellular or lightweight concrete is applied over panels
- 6 Identification index appears on all panel in the construction grades listed in footnote #1.

## ALLOWABLE LUMBER SHEATHING SPANS

Sheathing <sup>1</sup>		Maximum Spans	
		Roof	Floor
1" Thick Nominal	Solid	32"	16"
	Spaced <sup>2,4</sup>	24"	Not Applicable
2" Thick Nominal (Douglas Fir-Larch No. 2 or better)	Supported Ceiling	6' - 6" <sup>3</sup>	4' - 6"
	No Ceiling	8' - 0" <sup>3</sup>	4' - 6"

**Notes:**

- 1 Spans of sheathing boards placed diagonally across rafters or joists shall be measured along the longitudinal axis of the plank. Utility grade not permitted.
- 2 Shall be continuous over three or more supports.
- 3 Douglas Fir-Larch No. 3 also permitted.
- 4 Merchantable, No.4 Common and No. 3 not permitted.